UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/993,778	11/05/2001	Fereidoon Heydari	01-S-054 (1678-49)	7609

30431 7590 08/27/2004

STMICROELECTRONICS, INC.
MAIL STATION 2346
1310 ELECTRONICS DRIVE
CARROLLTON, TX 75006

EXAMINER	
RODRIGUEZ, GLENDA P	

ART UNIT	PAPER NUMBER
2651	

DATE MAILED: 08/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/993,778	Applicant(s) HEYDARI ET AL.	
	Examiner Glenda P. Rodriguez	Art Unit 2651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *13-21 and 23* is/are allowed.

6)☒ Claim(s) *1-12 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 6,7 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Fisher (US Patent No. 5, 384, 671).

Regarding Claim 1, Fisher teaches a synchronous partial response maximum likelihood servo channel operable to recover servo data from servo wedges that identify respective data sectors on a data-storage disk (Pat. No. 5, 384, 671; See Abstract and Col. 13, L. 12 – Col. 14, L. 4. Fisher teaches that the SAM provides positioning information with respect to the location of the head with respect to the disk.), and a processor coupled to and operable to control the servo channel (Pat. No. 5, 384, 671; Col. 13, Lines 27-33. Fisher further teach the use of servo detector, which is used to detect servo data. See also Fig. 4, Elements 76, 78, 80. It is well known in the art that servo processing switches over data processing, therefore making data processing inoperative when servo processing is being performed. See also Col. 3, L. 42-47, Col. 6, L. 47-66 and Col. 10, L. 8-27 and Col.. 12, L. 18-25, Col. 15, L. 38-Col. 16, L. 6).

Regarding Claim 2, Fisher teaches all the limitations of Claim 1. Fisher further teaches wherein:

> The servo channel is operable to receive a servo-data sample clock (Pat. No. 5, 384, 671; Col. 13, Line 64 to Col. 14, Line 4. Fisher

teach that the timing circuit resynchronizes with the servo address marks (SAM), which is a part of a servo sector.);

And the servo channel comprises a digital timing-recovery loop operable to synchronize the sample clock to the servo data (Pat. No. 5, 384, 671; Col. 12, Lines 5-17. The timing loop synchronizes the detected data.).

Regarding Claim 3, Fisher et al. teaches all the limitations of Claim 1. Fisher further teaches wherein:

The servo channel is operable to receive a servo signal that represents the servo data, the servo signal having an amplitude (Pat. No. 5, 384, 671; See Abstract and Col. 3, Lines 48-53. Fisher et al. teach that the servo sectors provide the synchronization data used for the servo sector in order to be synchronized.);

And the servo channel comprises a digital gain-recovery loop operable to adjust the gain of the servo signal to a target (Pat. No. 5, 384, 671; Col. 12, Lines 5-17. Fisher et al. teach that the digital gain loop adjusts any error or bias and even offset that may have occurred during the readback of the servo signal.).

Regarding Claim 6, Fisher teaches all the limitations of Claim 1. Fisher further teaches wherein the servo channel includes a Viterbi detector operable to recover the servo data from the servo wedges (Pat. No. 5, 384, 671; Fig. 4, Element 50 and Col. 11, Lines 26-31).

Regarding Claim 7, Fisher teaches all the limitations of Claim 1. Fisher further teaches wherein the servo channel includes a decoder operable to decode the recovered servo data (Pat. No. 5, 384, 671; Col. 11, Lines 26-31. Fisher also teach that the Viterbi detector also decodes the data.).

Regarding Claim 10, Fisher teaches all the limitations of Claim 1. Fisher further teaches a disc drive comprising an interface circuit operable to couple the recovered servo data to and receive data from a circuit external to the servo circuit (Pat. No. 5, 384, 671; See Fig. 4, wherein Fisher et al. teach a head disc assembly (HAD, Element 12) with a preamplifier circuit (Element 28) and a servo circuit placed separately in an electronic circuit board (PCB, Element 14).).

3. Claims 4, 8, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fisher (US Patent No. 5, 384, 671) in view of Tuttle et al. (US Patent No. 6, 108, 151).

Regarding Claim 9, Fisher teaches a servo circuit, comprising:

> A synchronous partial response maximum likelihood servo channel operable to recover servo data from servo wedges that identify respective data sectors on a data-storage disk (Pat. No. 5, 384, 671; See Abstract);

However, Fisher does not explicitly disclose a processor is operable to detect one of the servo wedges during or after disk spin-up search operation without first detecting a spin-up wedge and the servo wedge being the first wedge detected. However, this feature is well known in the art as disclosed by Tuttle et al., wherein it teaches the detection of the preamble of the servo wedges without first detecting a spin up wedge (Pat. No. 6, 108, 151; Col. 4, Lines 29-47 and Abstract). It would have been obvious to a person of

ordinary skill in the art, at the time the invention was made, to modify Fisher et al.'s invention with the teaching of Tuttle et al. in order to detect one of the servo wedges during or after disk spin-up search operation without first detecting a spin-up wedge in order to synchronize the timing recovery in the servo channel.

Regarding Claim 11, Fisher teaches all the limitations of Claim 1. However, Fisher does not explicitly disclose wherein the synchronous servo channel is operable to detect spin-up wedges on the data-storage disk during a spin-up search operation. Tuttle et al. teach the use of wherein a servo channel that is operable to detect spin-up wedges on the data-storage disk during a spin-up search operation (Pat. No. 6, 108, 151; Col. 15, Lines 23-30). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Fisher's invention with the teaching of Tuttle et al. to detect servo wedges while performing a spin-up operation in order for the medium to be able to better locate the positions of the head in the disk surface.

Regarding Claims 4, Fisher teaches all the limitations of Claim 1. However, Fisher does not explicitly disclose further comprising: sampling the servo data with a sample clock; calculating an initial phase difference between the sample clock and the servo data; and using the initial phase difference to facilitate synchronizing the sample clock to the servo data. Tuttle et al. teach the use of the servo data being sampled by a servo clock (Col. 8, Line 48-49), a phase error detector that computes sample values from a generator and acquires samples from the servo signal by acquisition (Pat. No. 6, 108, 151; Col. 12, Lines 56-62) and computes the sampling phase error (Pat. No. 6, 108, 151; Col. 13, Lines 17-30). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Fisher's invention with the teaching of

Tuttle et al. in order for the medium to be able to correct the phase error between the clock and the servo data in order to more effectively minimize any errors in the read channel during reproduction.

Regarding Claims 8, Fisher teaches all the limitations of Claim 1. However, Fisher does not explicitly disclose further comprising asynchronously demodulation a servo-position burst from the servo data. Tuttle et al. teach the use of an asynchronous servo position demodulator (Pat. No. 6, 108, 151; Col. 20, Lines 27-38). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Fisher's invention with the teaching of Tuttle et al. in order for the medium to be able to have an asynchronous demodulator of servo burst positions in order for the medium to seek its position more efficiently.

4. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fisher et al. (US Patent No. 5, 384, 671) in view of Satoh et al. (US Patent No. 5, 818, 655). Fisher et al. teaches all the limitations of Claim 1. However, Fisher does not explicitly disclose wherein a servo channel includes an analog-to-digital converter operable to convert an analog pr4-equalized servo signal into the digital domain. Satoh et al. teach the use of teaches a an analog-to-digital converter that changes the PR4 equalized signal into the digital domain (Pat. No. 5, 818, 655; Col. 12, Lines 38-49). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify of Fisher's invention with the teaching of Satoh et al. in order for the medium to be able to convert the data with the analog-to-digital converter using a partial response class IV scheme in order for the data to use a known type of coding.

5. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle et al. (Patent No. 6, 108, 151) in view of Fisher (US Patent No. 5, 384, 671). Tuttle et al. teach a method comprising:

> Asynchronously detecting a servo sector disclosed on a surface of a data storage disk while or after the disk rotates from a first to a steady-state speed without first detecting a spin-up wedge (Pat. No. 6, 108, 151; Col. 4, Lines 29-47).

Tuttle et al. fail to teach wherein synchronously using a partial-response-maximum-likelihood-detection algorithm to detect a position of a read head with respect to the surface of a disk. Fisher et al. teaches a synchronous partial response maximum likelihood servo channel operable to recover servo data from servo wedges that identify respective data sectors on a data-storage disk (Pat. No. 5, 384, 671; See Abstract), and a processor coupled to and operable to control the servo channel (Pat. No. 5, 384, 671; Col. 13, Lines 27-33). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Tuttle et al.'s invention to detect the position information in order to synchronize the servo information and data information in the channel and the read head.

Response to Arguments

Applicant's arguments with respect to claim 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 6/15/2004 with respect to Claim 22 has been fully considered but they are not persuasive. Applicant argues that neither Fisher nor Tuttle et al. does ~~not~~ teach ~~to~~ asynchronously detecting a servo wedge without first detecting a

spin up wedge. Examiner cannot concur with the Applicant because according to Tuttle et al., the servo address mark forms part of the servo data being on the disk, therefore placing it as the servo wedge (See Fig. 2A and B and Col. 4, L. 23-Col. 4, L. 12. the servo address mark proceeds to give the initial position of the head with respect to the disk.).

Allowable Subject Matter

Claims 13-21 and 23 are allowed.

The reasons for allowance in Claims 13-21 and 23 are found in Paper #10, dated 2/11/2004.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenda P. Rodriguez whose telephone number is (703) 305-8411. The examiner can normally be reached on Monday thru Thursday: 7:00-5:00; alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (703) 305-4040. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

SINH TRAN
PRIMARY EXAMINER

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gpt
August 16, 2004.